

WABUA, A NEW SPIDER GENUS (ARANEAE: AMAUROBIOIDEA: KABABININAE)
FROM NORTH QUEENSLAND, AUSTRALIA

VALERIE TODD DAVIES AND CHRISTINE LAMBKIN

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Eleven new species of *Wabua* gen. nov. are described; these are *W. major*, the type species and *W. hypipamee*, *W. kirrama*, *W. seaview*, *W. elliot*, *W. eungella*, *W. crediton*, *W. aberdeen*, *W. cleveland*, *W. paluma* and *W. halifax*. All were collected between latitudes 17°16' and 21°13'S. A cladistic analysis shows that the Kababininae continues to form a well supported monophyletic group though its placement in a family remains problematical. □ *Araneae, Amaurobioidea, Kababininae, Wabua, taxonomy, distribution, Queensland, Australia.*

Valerie Todd Davies, Queensland Museum, PO Box 3300, South Brisbane 4101, Australia;
Christine Lambkin, Department of Zoology & Entomology, University of Queensland,
St Lucia 4072, Australia; received 10 November 1999.

This is the fourth genus to be described in the subfamily Kababininae: others are *Kababina* Davies 1995, *Carbinea* Davies 1999 and *Malarina* Davies 2000. The three described genera are all confined to the Wet Tropics region of northern Queensland which extends from Cooktown to Townsville. *Wabua* gen. nov. is also found in the Wet Tropics region (between latitudes 17°16' and 18°36'S) and, unlike the others, extends further south to Crediton (21°13'S), mid-east Queensland. For nomenclatural purposes Davies is designated the author of the names of the new genus and its species. All the species are named for their type locality. The female epigynum varies little between species whereas the male palp is complex and provides most of the characters for separation of species. The figures of epigyna and locality of specimens should aid identifications when using the key.

MATERIALS AND METHODS

Collection methods include litter-sieving followed by heat extraction in funnel, pitfall (PF) collection, pyrethrum (PY) spraying of tree trunks and fallen logs, hand collecting from under logs in daylight and night collecting. Notation of spines follows Platnick & Shadab (1975). All material is lodged in the Queensland Museum (QM). Cladistic methods are given under the section on relationships of *Wabua*.

Abbreviations. Most spiders were collected by G.B. Monteith (GBM) and fellow collectors D. Cook (DC), D. Yeates (DY), G. Thompson (GT), H. Janetzki (HJ) and S. Hamlet (SH); other collectors include R. Raven (RR) and V.E. Davies (VED). In location data: State Forest

(SF), National Park (NP). S and E are given in the latitude/longitude data for the holotype only and omitted for the paratypes.

Anatomical abbreviations used in text, figures and in the list of characters and their states (Table 2): AL, abdomen length; ALE, anterior lateral eyes; ALS, anterior lateral spinnerets; AME, anterior median eyes; APOPH, apophysis; ATP, anterior tegular process; AW, abdomen width; CB, cymbium; CAL, calamistrum; CH, cheliceral; CL, carapace length; CR, cribellum; CW, carapace width; E, embolic; EG, epigastric groove; EPIG, epigynal; ID, insemination duct; MAP, major ampullate spigots; MT, metatarsal; P, patellar; PCR, paracribellar spigots; PE, parembolic; PLD, prolaterodorsal; PLE, posterior lateral eyes; PLS, posterior lateral spinnerets; PME, posterior median eyes; PMS, posterior median spinnerets; RTA, retrolateral tibial apophysis; T, tarsal; TRICH trichobothria.

SYSTEMATICS

Subfamily KABABININAE Davies 1999

DIAGNOSIS. Medial atrium of epigynum wider than long; spermathecae posterior or lateral to atrium. Male palp with rounded tegulum with prolateral groove; course of sperm duct showing clearly. Membranous conductor; median apophysis absent. Tibial apophysis with ventral and dorso-retrolateral branches.

DESCRIPTION. Carapace highest in foveal region; posterior eye row straight or slightly recurved; AME reduced. Chelicera with two retromarginal and two promarginal teeth; prolateral filamentous seta at base of fang longer

than other setae. Feathery hairs on legs, ridged cuticle. Male palp: embolus with or without proximal embolic apophysis. Cribellum (two fields) present or absent in females, absent in males; large broad colulus present when cribellum is absent.

Wabua Davies gen. nov.

TYPE SPECIES. *Wabua major* sp. nov.

ETYMOLOGY. Derived from the Aboriginal 'wabu', meaning 'forest' in the Djirbal language of north Queensland.

DIAGNOSIS. Female cribellate (cf. *Carbinea*). Epigynum without posterior knob (cf. *Malarina*); with shallow medial atrium. Conductor and embolus of male palp arising antero-ventrally on tegulum (cf. *Kababina*); without proximal par-embolic apophysis (cf. *Carbinea* and *Malarina*).

DESCRIPTION. Small spiders (most less than 4.0). Carapace pale with 2 dark longitudinal bands (see *Malarina* Davies & Lambkin, 2000: fig. 1A) sometimes reduced to dark lines radiating from fovea. Abdomen with a pattern of paired spots giving way to light median chevrons on dark ground (see *Kababina*, Davies, 1995: fig. 1D). Legs banded with darker rings. Conductor with stalk broadening to saucer shape with ragged edge. Embolus broad, narrowing distally.

KEY TO SPECIES OF *WABUA*

1. Posterior margin of epigynal atrium close to epigastric furrow (Figs 1B, 2A). Leg I equal to or slightly longer than IV 2
Posterior margin of epigynal atrium well forward of epigastric furrow (Fig. 8F,K). Leg I shorter than IV 10
2. RTA of male palp with distal and proximal projections (Fig. 1A,J). Distance between anterior margin of epigynal atrium and anterior loop of insemination duct less than length of atrium 3
RTA without proximal projection. (Distance between anterior margin of atrium and anterior loop of insemination duct half - x2 length of atrium) 4
3. RTA with proximal bulge (Fig. 2C). Without mid-proventral protrusion of tegulum *major*
RTA with large proximal spur (Figs 1J, 2D). With mid-ventral protrusion of tegulum (Fig. 1K) *hypipamee*
4. Distance between anterior margin of atrium and anterior loop of insemination duct x 1 or less length of atrium. (Male palpal tibia with 2-4 retroventral setae, either discrete or forming a comb) 5
Distance between anterior margin of atrium and anterior loop of insemination duct x 2 the length of atrium (Fig. 3G). Male palpal tibia with 3 long retroventral setae (Fig. 3J) *seaview*
5. Tibia of male palp with 4 long retroventral setae forming a comb (Fig. 6A) 6

- Tibia of male palp with 2-3 discrete retroventral setae (Fig. 4A) 8
6. Embolus with smooth curve from origin to prolateral edge (Fig. 4J) *eungella*
Embolus widening at prolateral turn (Fig. 6A) 7
 7. Embolic apophysis with 2 pointed 'folds' subdistal to embolus (Figs 6A, 7D) *crediton*
Embolic apophysis with 2 reduced blunt folds (Fig. 6J) *aberdeen*
 8. Tibia of male palp about as long as wide. ATP absent. 9
Tibia of male palp much longer than wide. Tegulum with mid-proventral protrusion and digitiform ATP (Fig. 8A) *cleveland*
 9. Embolus with proventral keel (Figs 4A, 5A). RTA pointed, digitiform *elliott*
Embolus without proventral keel (Fig. 2E). RTA blunt *kirrama*
 10. Embolus with large retrolateral keel and smaller prolateral keel distally (Fig. 8J); palpal tibia as long as wide *paluma*
Embolus smooth with small distal keel (Figs 8O, 9D,E); palpal tibia slightly longer than wide *halifax*

Wabua major Davies sp. nov.

(Figs 1A-E, 2A-C, 10A; Table 1)

MATERIAL. HOLOTYPE: ♀, Majors Mtn, N Qld. 17°38'S, 145°32'E, litter, 14-20.iv.1978, VED, RR (QM S39203). PARATYPES: N Qld: ♂, same data (S39204); 6♂, ♀, same data (S39205); ♀, Majors Mtn, 7km SE Ravenshoe, 1100m, sieved litter, 4.v.1983, GBM, DY (S39206); 4♀, Maalan SF, litter, 20.iv.1978, VED, RR (S39207); 2♀, Mt Father Clancy, Maalan SF, litter, 21 iv.1978, RR (S39208); ♂, Mt Father Clancy, 9km S Millaa Millaa, PF, 6-14.xii.1988, GBM, GT (S39209); 2♀, ♂, Downey Ck, 25km SE Millaa Millaa, 17°39', 145°47', sieved litter, 400m, 7.xii.1988, GBM, GT (S39210); ♀, ♂, Palmerston NP, E margin, 17°37', 145°46', 400m, PF, 2.xi.-10.xii.1995, GBM, DC (S39211); 4♂, same locality, 10.xii.1995-7.ii.1996 (S39212); ♀, 3 penult. ♂, Tully Falls Rd, 10km S Ravenshoe, 17°43', 145°31', sieved litter, 900m, 8.xii.1989, GBM, GT, HJ (S39213); ♂, Red Rd turnoff, Tully Falls Rd, 17°50', 145°32', 750 m, PF, 8.xii.1989-5.i.1990, GBM, GT, HJ (S39214); ♂, 4♀, Upper Boulder Ck via Tully, 17°50', 145°54', 900m, sieved litter, 27.x.1983, GBM, DY, GT (S39216); 6♀, same data (S39217); 7♂, ♀, Upper Boulder Ck, 11km NNW Tully, 850-1000m, PF, 17-18.xi.1984, VED, GBM, J. Gallon, DC, GT (S39218); ♀, same data, 1000m (S39219); ♀, 1000m, sieved litter, 17.xi.1984, GBM, VED, GT (S39220); ♀, 18.xi.1984 (S39221); ♀, 1000m, PY on mossy rocks, 6.xii.1989, GBM, GT, HJ (S42111); ♀, Mt Tyson, 2km W Tully, 17°55', 145°54', 650m, sieved litter, 7.v.1983, DY (S42112); 3♀, ♂, Mt Fisher (Kjellberg Rd), 17°32', 145°33', 1100m, litter, 18.v.1995, GBM (S42117); 4♀, same data (S42118); 4♀, ♂, Tower nr The Crater, 17°27', 145°29', 1230m, litter, 23.xi.1994, GBM (S42119); ♀, Mt Fisher, 7km SW Millaa Millaa, 17°34', 145°34', 1050m, litter, 27.iv.1982, GBM, DY, DC (S42120); 4♀, 2 penult. ♂, same data, 1100m, (S42121); 2 ♂, Millaa Millaa Lookout, 17°31', 145°34', 1000m, PF, 1.xii.1993-25.ii.1994, J. Hasenpusch (S42123); ♀, ♂,

Sluice Ck, 9km WSW Millaa Millaa, 17°33', 145°33', 1150m, sieved litter, 5.xii.1988, GBM,GT (S42124); ♂, Massey Ck, 12km SW Millaa Millaa, 17°37', 145°33', 1000m, sieved litter, 4.v.1983, GBM, DY (S42125); ♂, 21km S Atherton, 17°27', 145°28', 1040-1100m, sieved litter, 5.xi.1983, DY, GT (S42126).

DIAGNOSIS. Epigynum with broad antero-lateral gonopores, insemination ducts narrowing to form anterior loop back to spermathecae. Short male palpal tibia, excavated ventro-retrolaterally with distal spur and proximal bulge. Two long proventral tibial setae extending half-way up tegulum.

DESCRIPTION. *Female.* CL 1.4, CW 1.0, AL 1.6, AW 1.1. Viewed from above the eye rows are straight; from the front anterior row is straight, posterior row is procurved. Ratio of AME: ALE: PME: PLE is 5:10:10:10. Legs 1423 (Table 1). Notation of spines. Femora: I, D110, P001; II, D110, P001, R001; III, D100, P001, R001; IV, D100, P001, R001. Patellae: I-IV, D001. Tibiae: I, V010; II, P001, V010; III, D001, P001, V011, R011; IV, D101, P001, V111, R101. Metatarsi: spined with distal whorl 4-5. Epigynum (Figs 1B-E, 2A): broad shallow atrium, anterior gonopores. Spermathecae lateral to atrium. Cribellum with 2 fields; ALS with 2 major ampullate spigots, posterior slightly smaller; about 15 piriform spigots. PMS with large anterior spigot (minor ampullate), a lateral and a posterior spigot (cylindricals), 4-5 paracribellar (one shaft per base) and some aciniform spigots. PLS with a large anterior spigot and 9 smaller spigots of 2 sizes. Females ranged in length from 2.9-3.2.

Male. CL 1.7, CW 1.4, AL 1.8, AW 1.3. Ecribellate. Eyes similar to female. Legs 1=423 (Table 1). Notation of spines. Femora: I, D110, P002, R001; II, D110, P001, R001; III, D110, P001, R001; IV, D110, R001. Patellae: I, D001; II, D001; III, D101, IV, D101. Tibiae: I, P101,

V021; II D101, P101, V010, R001; III, D010, P101, V111, R101; IV D101, P111, V112, R011. Metatarsi: spined with distal whorl 4-5. ♂ palp (Figs 1A, 2B,C): embolus curved sharply with flange-like apophysis. Short tibia, slightly longer than wide, 1:0.9; excavated ventrally with distal spur-like apophysis and proximal bulge. Spinnerets: ALS with one major ampullate spigot and a nubbin, about 14 piriform spigots, some tartipores. PMS with large anterior spigot (minor ampullate) and 7-8 spigots of two sizes. PLS with several spigots. Large colulus. Males varied in length from 3.1-3.5.

DISTRIBUTION. (Fig. 10A) Widespread in rainforests from 400-1230m in the Hugh Nelson, Cardwell and Walter Hill Ranges to the immediate south and west of the Atherton Tableland.

***Wabua hypipamee* Davies sp. nov.**
(Figs 1F-K, 2D, 10B)

MATERIAL. HOLOTYPE: ♀, Mt Hypipamee NP, N Qld, 17°26'S, 145°28'E, 950m, stick brushing, 5.x.1980, GBM (QM S42169). PARATYPES: N Qld: ♂, 3 ♀, same data as holotype (S42113); 2♂, Maalan Rd, 2km S Palmerston Highway, 17°36', 145°42', 750m, PF, 26.xi.1994-10.i.1995, GBM, J. Hasenpusch (S42114); ♂, same data, 10.i.-7.iii.1995 (S42115); ♂, same data, 7.iii.-15.v.1995, (S42116); 3 ♀, ♂, Millaa Millaa Falls, 17°28', 145°36', 800m, litter, 17.v.1995, GBM (S42122); ♂, 21km S Atherton, 17°27', 145°28', 1040-1100m, sieved litter, 5.xi.1983, DY, GT (S42127); ♀, same data (S42128).

DIAGNOSIS. Tegulum with mid-proventral protrusion (cf. *W. major*); male palpal tibia with large spur-like proximal apophysis (cf. *W. major*).

DESCRIPTION. *Female.* CL 1.4, CW 1.0, AL 1.6, AW 1.1. Ratio of AME: ALE: PME: PLE is 4: 9: 9: 9. Legs 1423, I 5.3; II 4.6; III 4.0; IV 5.2. Notation of spines similar to *W. major*. Epigynum (Fig. 1F-I) Spinnerets: similar to *W. major*. Females varied in length from 3.0-3.6.

Male. CL 1.6, CW 1.3, AL 1.6, AW 1.1. Colouration and eyes similar to *W. major*. Legs 1=423, I 6.7; II 5.2; III 4.9; IV 6.7. Male palp (Figs 1J-K, 2D): tegulum with a ventral protrusion supporting the conductor and embolus; tibia with anterior ventral and retrolateral apophyses and large proximal spur. Males varied in length from 2.9-3.2.

DISTRIBUTION. (Fig. 10B) From rainforests at 750-1100m in the Hugh Nelson Range and adjacent parts of the Atherton Tableland. This is the northernmost species of *Wabua*. It overlaps partly with the range of *W. major*.

TABLE 1. Palp and leg measurements of ♀ (♂) *Wabua major* sp. nov.

	Femur	Patella	Tibia	Meta-tarsus	Tarsus	Total
Palp	0.7 (0.7)	0.2 (0.2)	0.5 (0.3)	- -	0.8 (0.8)	2.2(2.0)
Leg I	1.4 (1.7)	0.4 (0.5)	1.3 (1.8)	1.2 (1.7)	0.8 (1.0)	5.1 (6.7)
II	1.1 (1.5)	0.4 (0.5)	0.9 (1.3)	1.0 (1.3)	0.7 (0.7)	4.1 (5.3)
III	1.0 (1.4)	0.3 (0.5)	0.8 (1.1)	1.0 (1.2)	0.6 (0.7)	3.7 (4.9)
IV	1.3 (1.7)	0.4 (0.6)	1.2 (1.7)	1.3 (1.8)	0.7 (0.9)	4.9 (6.7)

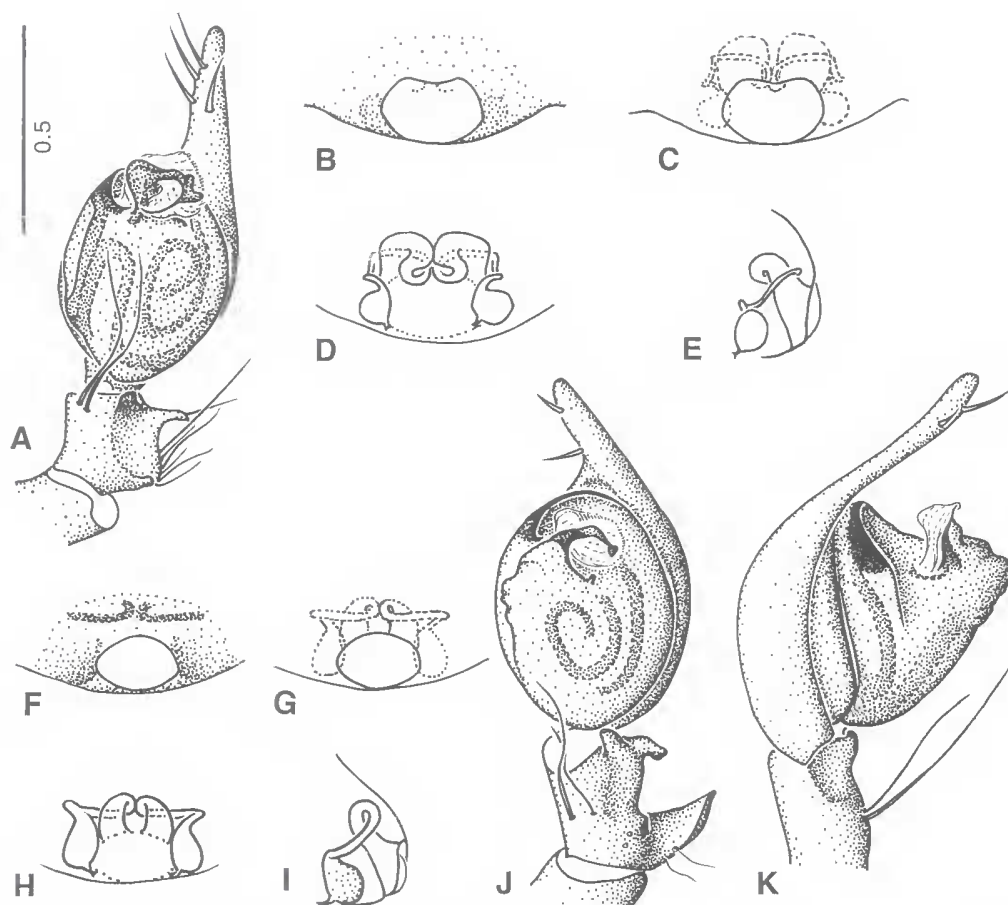


FIG. 1. A-E, *Wabua major* sp. nov.; A, ♂ palp (ventral); B-E, ♀ epigynum (ventral, ventral cleared, dorsal, lateral). F-K, *Wabua hypipamee* sp. nov.; F-I, ♀ epigynum (ventral, ventral cleared, dorsal, lateral); J, K, ♂ palp (ventral, prolateral).

***Wabua kirrama* Davies sp. nov.**

(Figs 2E, 3A-E, 10B)

MATERIAL. HOLOTYPE: ♀, Kirrama Ra, Mt Smoko turnoff, N Qld, 18°12'S, 145°46'E, 600m, PF, 10.xii.1986-11.i.1987, GBM, GT, SH (QM S42172). PARATYPES: N Qld: ♀, ♂, same data as holotype (S42132); ♂ ♀, Kirrama Ra. (nr Yuccabine Ck) 18°10', 145°45', 700m, sieved litter, 10.xii.1986, GBM, GT (S42131); ♀, Boulder Ck, via Tully, 17°50', 145°54', 650m, sieved litter, 27.x.1983, GBM, DY, GT (S42170); 3 ♀, 2 ♂, same data (S39215); 2 ♂, Downey Ck Rd, Palmerston NP, 17°36', 145°46', PF, 25.vii.-30.iii.1992, RR, P. & E. Lawless, M. Shaw (S24242); ♂, same locality, 30.x.1991-24.vii.1992, P. Lawless, RR, M. Shaw (S24592).

DIAGNOSIS. Embolus with small fluted flange subdistally; palpal tibia with small blunt distal RTA only (cf. *W. major* and *W. hypipamee*).

DESCRIPTION. *Female.* CL 1.4, CW 1.0, AL 1.5, AW 1.0. Colour and pattern similar to other species. Legs 1423, I 5.0; II 3.9; III 3.6; IV 4.8. Epigynum (Fig. 3B-E). Females varied in length from 2.9-3.1.

Male. CL 1.4, CW 1.1, AL 1.3, AW 1.1. Legs 1423, I 6.2; II 4.9; III 4.4; IV 6.1. Male palp (Figs 2E, 3A): very small inturned RTA. Males varied little in length 2.7-2.8.

DISTRIBUTION. (Fig. 10B) Occurs at 400-700m in rainforests of the Kirrama and Walter Hill Ranges. It occurs mostly to the south of the range of *W. major* but overlaps with it in the Walter Hill Range.

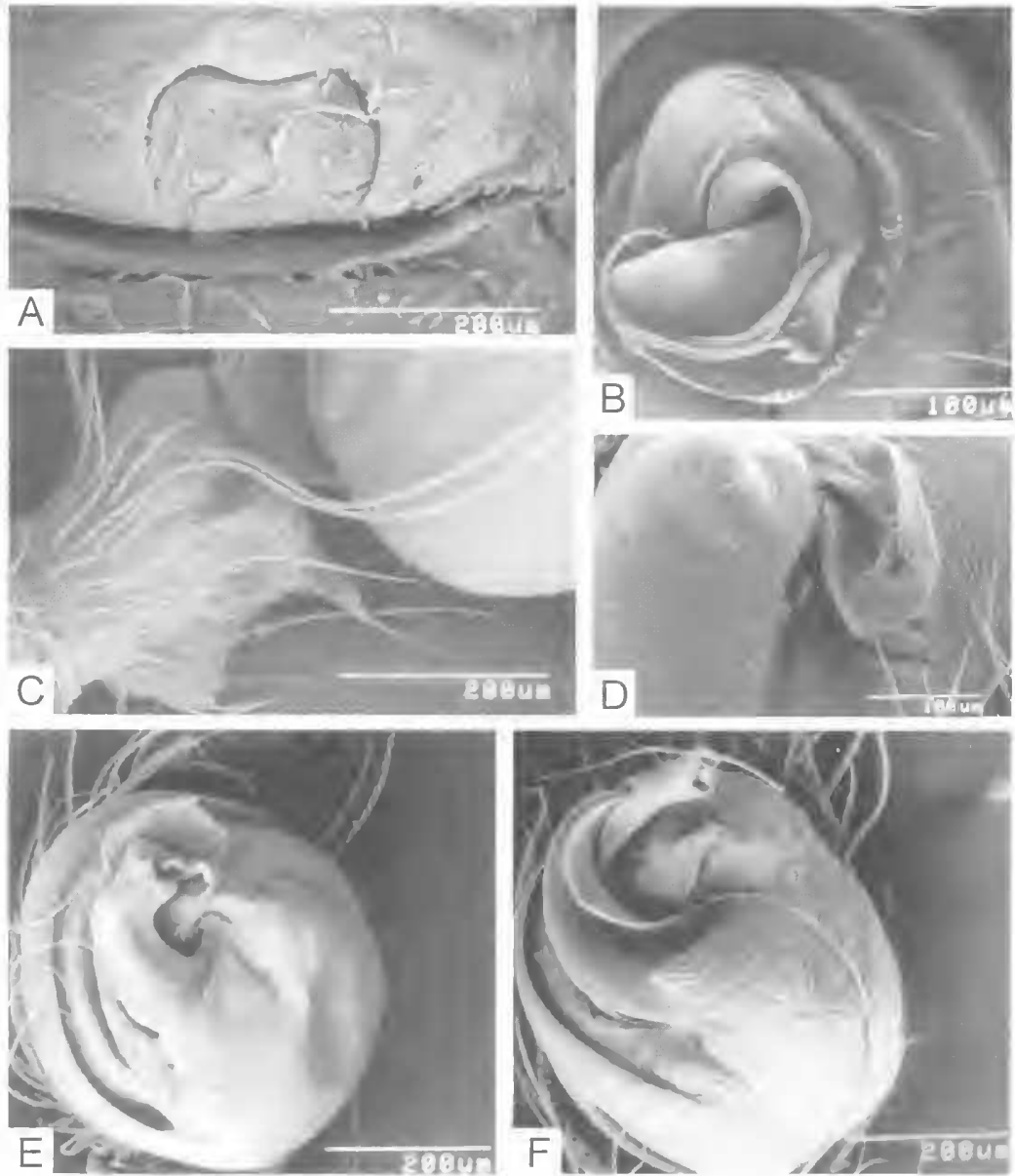


FIG. 2. A-C, *Wabua major* sp. nov.; A, epigynum (ventral); B,C, ♂ palp, B, embolic region, C, tibial apophysis. D, *Wabua hypipamee* sp. nov., protrusion of tegulum, embolus and conductor. E, *Wabua kirrama* sp. nov. (Boulder Ck) ♂ palp (ventral). F, *Wabua seaview* sp. nov. ♂ palp (ventral).

***Wabua seaview* Davies sp. nov.**
(Figs 2F, 3F-K, IOB)

MATERIAL. HOLOTYPE: ♀, Seaview Range, Mt Fox Rd, N Qld, 18°38'S, 145°54'E, 600m, 15.xii.1986, GBM, GT, SH (QM S42171). PARATYPES: N Qld: ♀, 3♂,

same data as holotype (S42133); 3♀, Mt Fox Rd, 18°50', 145°50', 600m, sieved litter, 15.xii.1986, GBM, GT (S42134); ♂, ♀, same locality, 2.i.1987, SH (S42135); 3♂, ♀, Wallaman Falls Rd Junction, 18°39', 145°52', 650m, PF, 5-12.ii.1996, GBM (S42136); ♂, same data, flight intercept trap (S42139); ♀, Wallaman Falls Rd, 500m, PF,

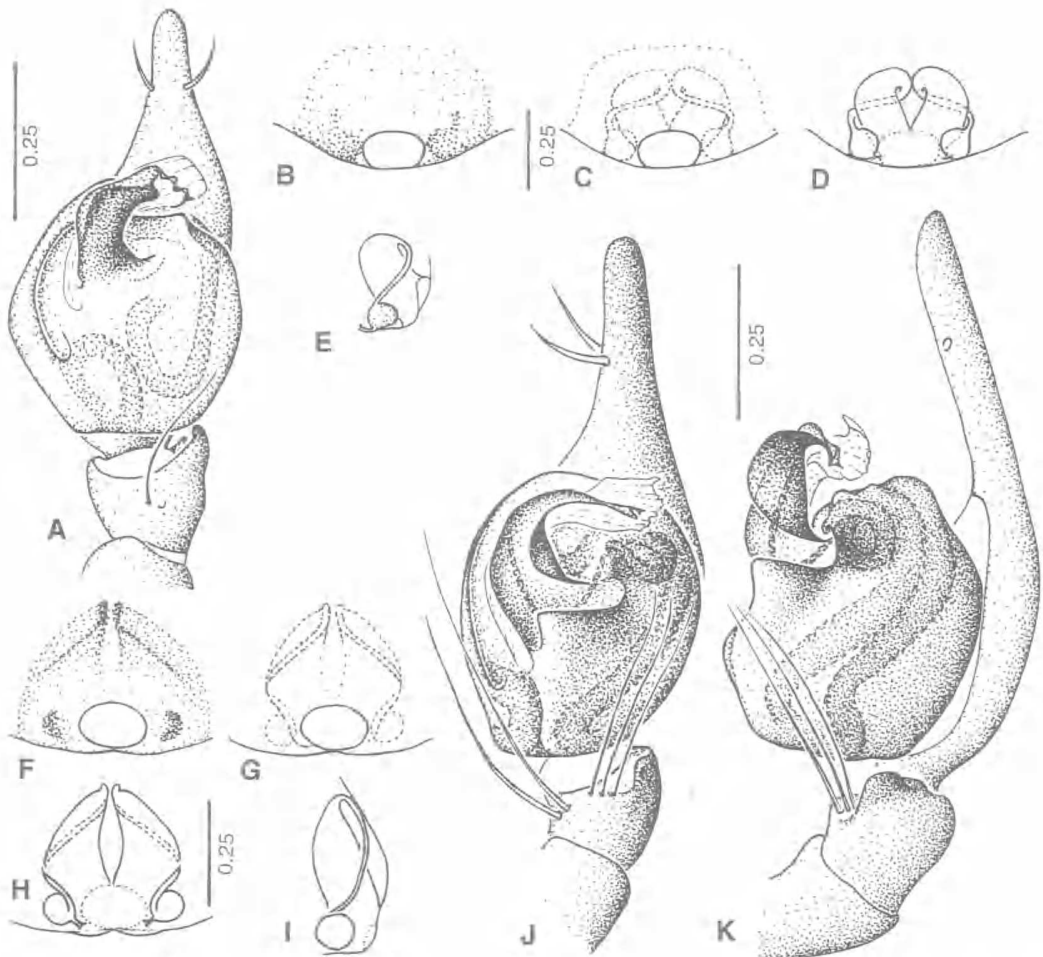


FIG. 3. A-E, *Wabua kirrania* sp. nov.: A, ♂ palp (ventral). B-E, epigynum (ventral, ventral cleared, dorsal, lateral). F-K, *Wabua seaview* sp. nov.: F-I, epigynum (ventral, ventral cleared, dorsal, lateral); J, K, ♂ palp (ventral, retrolateral).

14.xii.1986-2.i.1987, GBM, GT, SH (S42137); ♀, Wallaman Falls Rd, 18°38', 145°51', 650m, litter, 5.ii.1996, GBM (S42138).

DIAGNOSIS. The distance between the anterior margin of the atrium and the anterior loop of the insemination ducts is almost twice the length of the atrium (cf. *W. major* and other species). Keeled retrolateral edge of embolus; small blunt RTA. Palpal tibia with 3 discrete retrolateral setae.

DESCRIPTION. *Female.* CL 1.8, CW 1.4, AL 1.9, AW 1.4. Colouration and pattern similar to other species. Legs 1423, I 7.0; II 5.6; III 5.0; IV 6.9. Epigynum (Fig. 3F-I). Females varied in length from 3.3-3.8.

Male. CL 1.7, CW 1.4, AL 1.6, AW 1.3. Legs 1=423, I 7.0; II 5.6; III 5.0; IV 7.0. ♂ palp (Figs 2F, 3J, K): retrolateral edge of embolus reflexed. Palpal tibia with 3 retroventral setae; RTA small, blunt. Males varied in length from 3.0-3.4.

DISTRIBUTION. (Fig. 10B) Restricted to the Seaview Range where it occurs in rainforests at 500-650m.

***Wabua elliot* Davies sp. nov.**
(Figs 4A-E, 5A, 10B)

MATERIAL. HOLOTYPE: ♀, Mt Elliot summit, N Qld, 19°30'S, 146°57'E, 1150m, 26.iii.1991, GBM, DC (QM S17863). PARATYPES: N Qld: 2♂, ♀, same data as

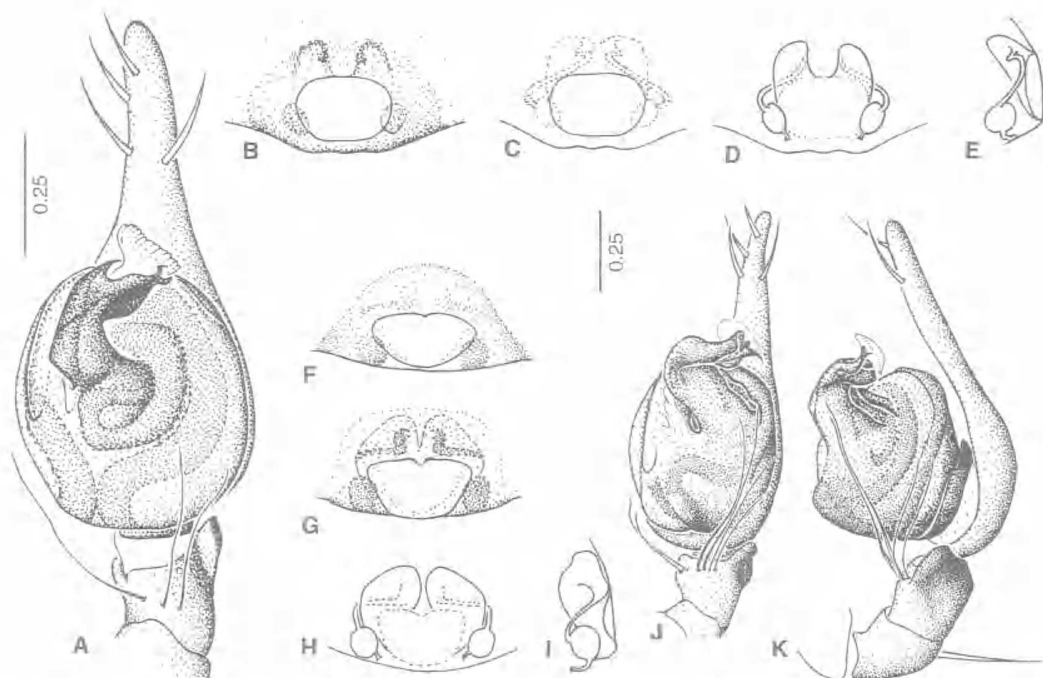


FIG. 4. A-E, *Wabua elliot* sp. nov.; A, ♂ palp (ventral); B-E, epigynum (ventral, ventral cleared, dorsal, lateral). F-K, *Wabua eungella* sp. nov.; F-I, epigynum (ventral, ventral cleared, dorsal, lateral); J, K, ♂ palp (ventral, retrolateral).

holotype, DC (S42145); ♀, Mt Elliot, North Ck, 19°29', 146°57', 1000m, 25-27.iii.1991, GBM, DC (S42146); 2♂, ♀, same data (S17876); ♂, Mt Elliot summit, 1150m, PF and intercept traps, 26.iii.-12.v.1991, DC (S42147); ♂, same locality, PF, 1-26.iii.1991, A. Graham (S42165); 2♀, 5♂, Mt Elliot NP, Upper North Ck, 1000m, PF, 3-5.xii.1986, GBM, GT, SH (S42166).

DIAGNOSIS. Distance between the anterior margin of the atrium and the anterior loop of the insemination ducts is less than half the length of the atrium (cf. *W. seaview*). Long proventral keel on embolus; RTA pointed digitiform (cf. other species); 3 long discrete ventral setae on palpal tibia.

DESCRIPTION. *Female.* CL 1.5, CW 1.3, AL 1.8, AW 1.3. Carapace pattern of dark lines radiating from fovea; abdominal pattern similar to other species. Eyes, notation of leg spines similar to *W. major*: Legs 1423, I 7.1; II 5.7; III 5.1; IV 6.9. Epigynum (Fig. 4B-E): large atrium; distance between anterior loop of insemination duct and anterior margin of atrium is less than half length of atrium. Females varied in length from 3.2-3.8.

Male. CL 1.8, CW 1.4, AL 1.6, AW 1.1. Legs 1=423, I 8.2; II 6.7; III 6.1; IV 8.2. Male palp

(Fig. 4A): proventral keel on embolus, tibia broader than long, 1:0.7, RTA pointed with edge incurved. Males varied in length between 3.2-3.8.

DISTRIBUTION. (Fig. 10B) Restricted to the rainforested summit (1000-1150m) of the isolated Mt Elliot, SW of Townsville.

***Wabua eungella* Davies sp. nov.**
(Figs 4F-K, 5B-F, 10B)

MATERIAL. HOLOTYPE: ♀, Eungella (schoolhouse), mid-east Qld, 21°10'S, 148°24'E, rainforest, litter, 12.ii.1986, J. Gallon, RR (QM S42191). PARATYPES: mid-east Qld: ♂, 6♀, same data as holotype (S42155); ♂, same locality, PF, 11-14.ii.1986, J. Gallon, RR (S42192); 13♂, 2♀, same data (S42154); 4♀, same locality, under logs, rocks, 12.ii.1986, (S9915), 2♂, Dalrymple Rd, Eungella NP, 21°02', 148°36', PF, 9.xi.1991-29.vii.1992, P. Lawless, RR, M. Shaw (S24808); ♂, same data (S24811).

DIAGNOSIS. Epigynum with large atrium, anterior loop of insemination duct just above anterior margin of atrium (cf. *W. seaview*); tibia with 4 long retroventral setae forming comb (cf. *W. elliot*); without proventral keel on embolus.

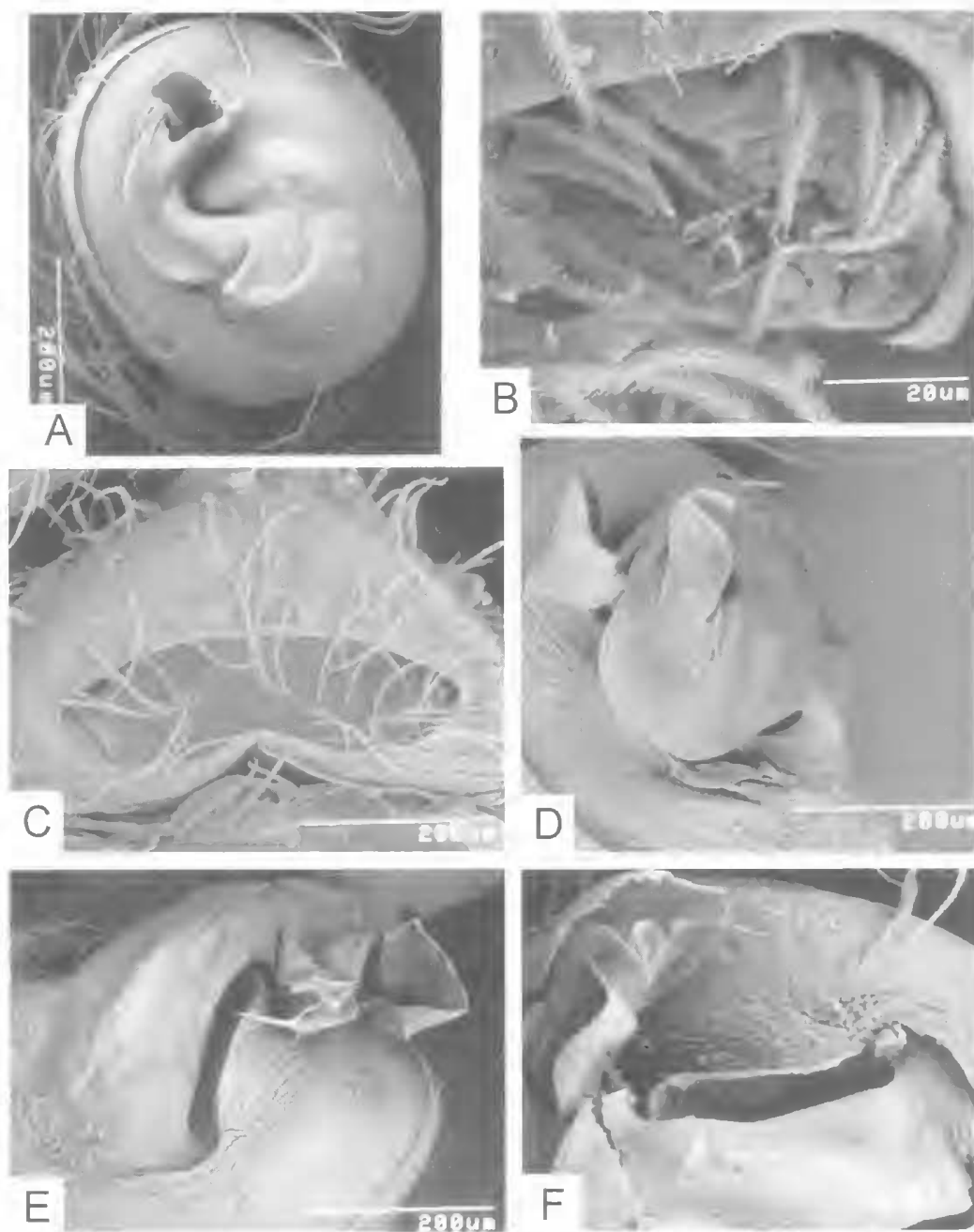


FIG. 5. A, *Wabua elliot* sp. nov., ♂ palp (ventral). B-F, *Wabua eungella* sp. nov.: B,C, ♀; B, ALS (l.), C, epigynum; D-F, ♂ palp, conductor/embolus (prolateral, retrolateral, ventral).

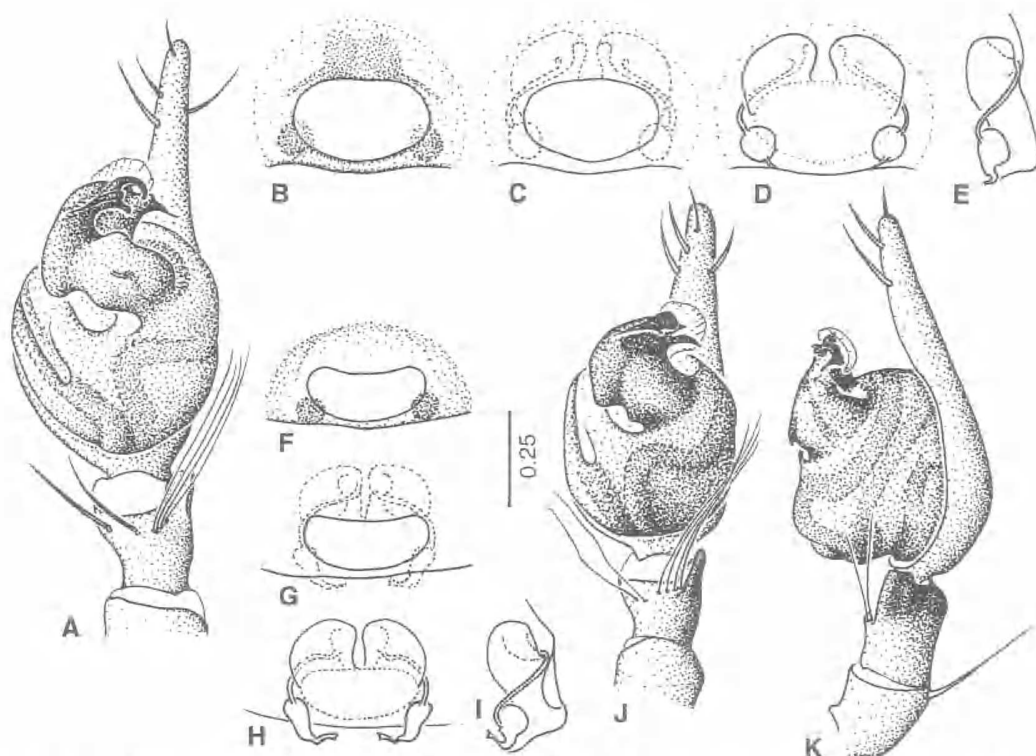


FIG. 6. A-E, *Wabua crediton* sp. nov.: A, ♂ palp (ventral); B-E, epigynum (ventral, ventral cleared, dorsal, lateral). F-I, *Wabua aberdeen* sp. nov.: F-I, epigynum (ventral, ventral cleared, dorsal, lateral); J, K, ♂ palp (ventral, retrolateral).

DESCRIPTION. *Female.* CL 1.9, CW 1.4, AL 2.0, AW 1.3. Legs 1423, I 8.1; II 6.4; III 5.8; IV 7.9. Epigynum (Figs 4F-I, 5C): broad atrium; loop of insemination duct close to anterior margin of atrium. Spinnerets: ALS with 2 major ampullate spigots, about 20 piriforms (Fig. 5B). PMS with large anterior spigot (minor ampullate), a large posterior and a large median spigot (cylindrical) 3-4 paracribellar spigots and some aciniform spigots. Short (10 setae) proximal calamistrum. Females varied in length from 3.3-3.9 in length.

Male. CL 1.9, CW 1.5, AL 2.0, AW 1.3, Legs 1423, I 8.3; II 6.5; III 2.0; IV 8.1. Male palp (Figs 4J,K, 5D-F): embolus with smooth curve from origin to prolateral edge; embolic apophysis with a larger (bulbous) and smaller fold, embolus pointed; tibia with 4 very long ventral setae forming a comb; RTA broad. Males varied in length from 3.4-3.9.

DISTRIBUTION. (Fig. 10B) Occurs in rainforests of the northern part of the Eungella portion of the Clarke Range, west of Mackay.

***Wabua crediton* Davies sp. nov.**
(Figs 6A-E, 7A-D, 10A)

MATERIAL. HOLOTYPE: ♀, Crediton, mid-east Qld, 21°13'S, 148°34'E, 920m, litter, 14-21.iv.1975, R. Kohout, VED (QM S42195). PARATYPES: Mid-east Qld: 2♂, same data as holotype (S42157); 2♂, ♀, same data, with egg sac from webs in bases of dead palm fronds (S42156); 2♂, Broken R. Eungella NP, 21°10', 148°30', PF, 10.xi.1991-29.vii.1992, P. Lawless, RR, M. Shaw (S24815); ♂, same data (S24033).

DIAGNOSIS. The distance between the anterior margin of the atrium and the anterior loop of the insemination duct is x1 atrial length (cf. *W. sea-view*). Male retroventral tibial setae forming comb (cf. *W. elliot*). Curve of embolus with marked widening at prolateral edge (cf. *W. eungella*).

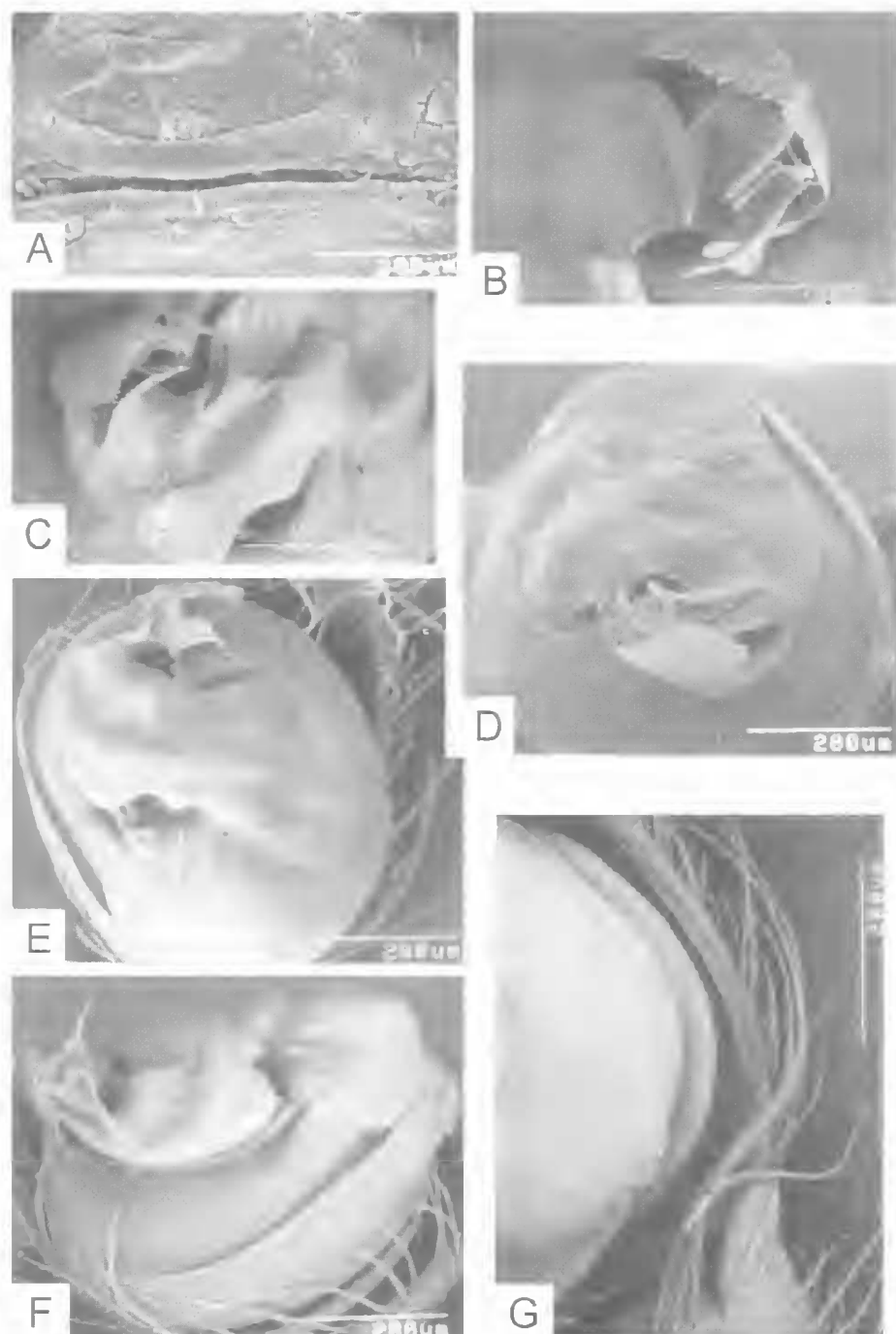


FIG. 7. A-D, *Wabua crediton* sp. nov.: A, epigynum; B-D, ♂ palp conductor/embolus, (antero-retrolateral, ventral, prolateral). E-G, *Wabua aberdeen* sp. nov.: E-F, ♂ palp (ventral, prolateral); G, RTA and comb of long setae.

DESCRIPTION. *Female.* CL 1.8, CW 1.3, AL 2.0, AW 1.2. Legs I=423, I 6.9; II 5.5; III 5.1; IV 6.9. Epigynum (Figs 6B-E, 7A). Females varied in length from 3.8-3.9.

Males. CL 2.1, CW 1.7, AL 2.0, AW 1.4. Legs I=423, I 8.7, II 7.1, III 6.5, IV 8.7. Male palp (Figs 6A, 7B-D). Embolus with marked widening of curve at prolateral edge (Figs 6A, 7C); embolic apophysis with 2 pointed 'folds' subdistal to embolus. Males were all longer than females, varying from 4.2-4.4.

DISTRIBUTION. (Fig. 10A) Occurs at the southern end of the Clarke Range and does not overlap with the range of the adjacent *W. eungella*.

***Wabua aberdeen* Davies sp. nov.**
(Figs 6F-K, 7E-G, 10A)

MATERIAL. HOLOTYPE: ♀, Mt Aberdeen south summit, N Qld, 20°12'S, 147°53'E, 900m, 8.iv.1997, GBM, DC (QM S42150). PARATYPES: N Qld: 2 ♂, 2 ♀, Mt Aberdeen south summit, 20°12', 147°55', 900m, rainforest litter, 8.iv.1997, GBM (S42149); ♀, same locality, PY, 6.xii.1996, GBM, (S42151); ♀, Mt Aberdeen north summit, 850m, rainforest, 5-7.xii.1996, GBM, DC (S42152); 3 ♀, Mt Aberdeen south summit, 900m, 6.xii.1996, GBM, DC and I. Cook (S42153); ♂, Aberdeen summit saddle, 20°12', 147°53', 800m, PF, 5.xii.1996-8.iv.1997, GBM, DC (S42168); ♀, ♂, Mt Abbot summit shoulder, 20°06', 147°45', 1000m, open forest PF, 7.xii.1996-9.iv.1997, GBM, DC (S42148).

DIAGNOSIS. Distance between anterior margin of atrium and anterior loop of insemination duct less than half length of atrium (cf. *W. seaweave*). Palpal tibia with 4 long setae forming comb (cf. *W. elliot*). Embolic curve with marked widening at prolateral edge (cf. *W. eungella*); embolic apophysis with 2 short-blunt folds subdistal to embolus (cf. *W. crediton*).

DESCRIPTION. *Female.* CL 1.8, CW 1.3, AL 2.0, AW 1.3. Legs 1423, I 6.8; II 5.4; III 5.0; IV 6.7. Epigynum (Fig. 6F-I): large atrium. Females varied in length from 3.0-3.8.

Male. CL 1.8, CW 1.4, AL 1.8, AW 1.2. Legs 1423, I 7.1; II 5.6; III 5.1; IV 7.0. Male palp (Figs 6J,K, 7E-G): prolateral keel on embolus; embolic apophysis with 2 short blunt folds subdistally; tibia with 4 long setae forming comb. Males varied in length from 3.6-3.8.

REMARKS. *W. eungella*, *W. crediton* and *W. aberdeen* appear to be closely related, differing only in embolic morphology.

DISTRIBUTION. (Fig. 10A) Restricted to the summits of the two isolated mountains, Abbot

and Aberdeen, which lie to the west of Bowen in the arid corridor between rainforest of the Wet Tropics and mid-east Queensland (see O'Keefe & Monteith, this issue). On Aberdeen it occurs in rainforest but the Mt Abbot site is in wet sclerophyll.

***Wabua cleveland* Davies sp. nov.**
(Figs 8A-E, 9A,B, 10A)

MATERIAL. HOLOTYPE: ♀, Mt Cleveland, N Qld, 19°16'S, 147°03'E, 100-300m, rainforest, 24.iii.1991, GBM, DC (QM S17923). PARATYPES: N Qld: ♂, same data as holotype (S42190); ♀, (S17883); ♂, Mt Cleveland summit, 560m, open forest, 22-24.iii.1991, GBM, DC (S42167); ♂, Killymoon Ck, 19°24', 147°01', S Townsville, PF, 26.x.1991-27.vii.1992, RR, P. Lawless, M. Shaw (S19945); ♂, nr Emmet Ck, S. Townsville, 19°27', 147°03', PF, 26.x.1991-27.vii.1992, P. Lawless, RR, M. Shaw (S19945); ♂, nr Emmet Ck, S Townsville, 19°27', 147°03', PF, 26.x.1991-27.vii.1992, P. Lawless, RR, M. Shaw (S21953). OTHER MATERIAL: ♂, Cape Upstart, N Qld, 19°44', 147°48', 4km N Station Hill, 550-650m, open forest 21-23.iv.1998, GBM (S42189).

DIAGNOSIS. Epigynal atrium wider than long 1:0.6. Distance between top of loop of insemination duct and anterior margin of atrium about a quarter length of atrium. Male palpal tibia longer than wide 1:0.4 (cf. all species). 3-4 very long discrete ventral setae on tibia. Anterior tegular process present (cf. all species). Male palpal femur much longer than cymbium, 1:0.7 (cf. other spp 1:1.1).

DESCRIPTION. *Female.* CL 1.6, CW 1.0, AL 1.9, AW (damaged). Ratio of AME: ALE: PME:PLE is 4:8:8:8. Carapace pattern of darker lines radiating from fovea; abdomen dark grey with pale paired spots. Legs I=423, I 5.9; II 4.6; III 4.3; IV 5.9. Notation of spines very similar to *W. major*. Epigynum (Fig. 8B-E): large atrium; small distance between anterior rim of atrium and anterior loop of insemination duct, about a quarter length of atrium.

Male. CL 1.6, CW 1.3, AL 1.4, AW 0.9. Legs 1423, I 7.2; II 5.8; III 5.2; IV 7.1. Male palp (Figs 8A, 9A) a short sclerotised tegular process near embolus (Fig. 9B); tibia much longer than wide 1:0.4; forwardly directed RTA. Males varied little in length 2.8-2.9.

DISTRIBUTION. (Fig. 10A) Occurs in open forest and dry rainforest at several localities near the coast between Mt Cleveland at Cape Upstart. This is the only *Wabua* species which extends down to sea level.

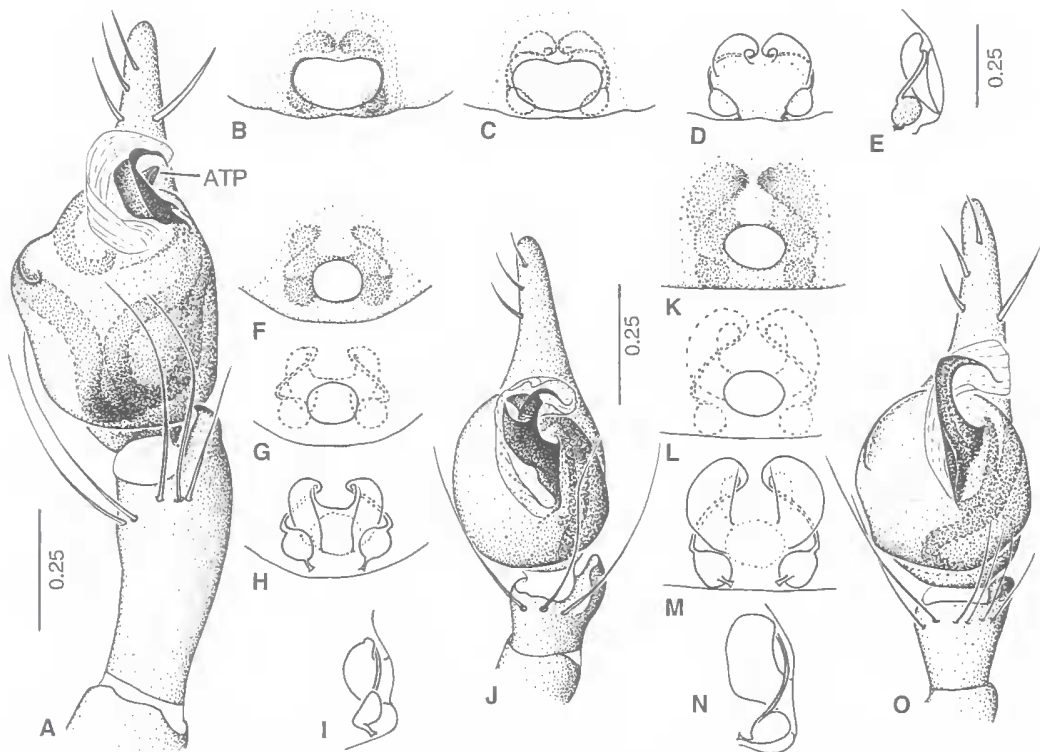


FIG. 8. A-E, *Wabua cleveland* sp. nov.; A, ♂ palpus (ventral); B-E, epigynum (ventral, ventral cleared, dorsal, lateral). F-J, *Wabua paluma* sp. nov.; F-I, epigynum (ventral, ventral cleared, dorsal, lateral); J, ♂ palpus (ventral). K-O, *Wabua halifax* sp. nov.; K-N, epigynum (ventral, cleared ventral, dorsal, lateral); O, ♂ palpus (ventral).

***Wabua paluma* Davies sp. nov.**
(Figs 8F-J, 9C, 10A)

MATERIAL. HOLOTYPE: ♀, Paluma Dam Rd, N Qld, 19°00'S, 146°19'E, 850m, site 5, PF, 8.xii.1990-5.ii.1991, GBM, J. Seymour (QM S42173). PARATYPES: N Qld: 2 ♂, same data as holotype (S42143); ♂, same locality, 800m, site 3, PF, 17.xi.-8.xii.1990, GBM, J. Seymour (S42140); ♂, 750m, site 4 (S42141); ♂, 720m, site 2, flight intercept trap (S42142); ♂, 850m, site 5, PF (S42144).

DIAGNOSIS. Small spiders (<3.0). Epigynal atrium is small, almost as long as wide, situated well above the epigastric groove (cf. all previously described species). Male palpal tibia is as wide as long (cf. *W. cleveland*) with 4 long discrete ventral setae; ventrally curved digitiform RTA.

DESCRIPTION. *Female.* CL 1.1, AL 0.9, AL 1.4, AW 0.9. Colour pattern similar to other species. Ratio of AME: ALE: PME: PLE is 4:8:8:8. Legs 4123, I 4.2; II 3.9; III 3.2; IV 4.4. Notation of spines similar to *W. major*. Short, proximal

calamistrum. Epigynum (Fig. 8F-I): small atrium, well forward of epigastric groove.

Male. CL 1.2, AL 1.0, AL 1.3, AW 0.9. Legs 4123, I 4.8, II 3.9; III 3.6; IV 4.9. Male palpus (Figs 8J, 9C): embolic apophysis with a retrolateral keel and smaller distal prolateral keel. Tibia as wide as long with 4 long discrete ventral setae; RTA incurved ventrally and forwardly pointed. Males varied in length from 2.3-2.6.

DISTRIBUTION. (Fig. 10A) Restricted to rainforests at 700-850m at the northern end of the Paluma Range.

***Wabua halifax* Davies sp. nov.**
(Figs 8K-O, 9D,E, 10B)

MATERIAL. HOLOTYPE: ♀, Mt Halifax summit, N Qld, 19°07'S, 146°23'E, 1050m, rainforest PF, 19-21.iii.1991, GBM, DC (QM S42193). PARATYPES: N Qld: ♀, ♂, same data as holotype (S42163); ♂, Mt Halifax, SE ridge, 950m, 19-21.iii.1991, GBM, DC (S42164); ♂, Mt Halifax summit, PF, heath, 19-21.iii.1991, GBM, DC (S17965), 3♂, Mt Halifax

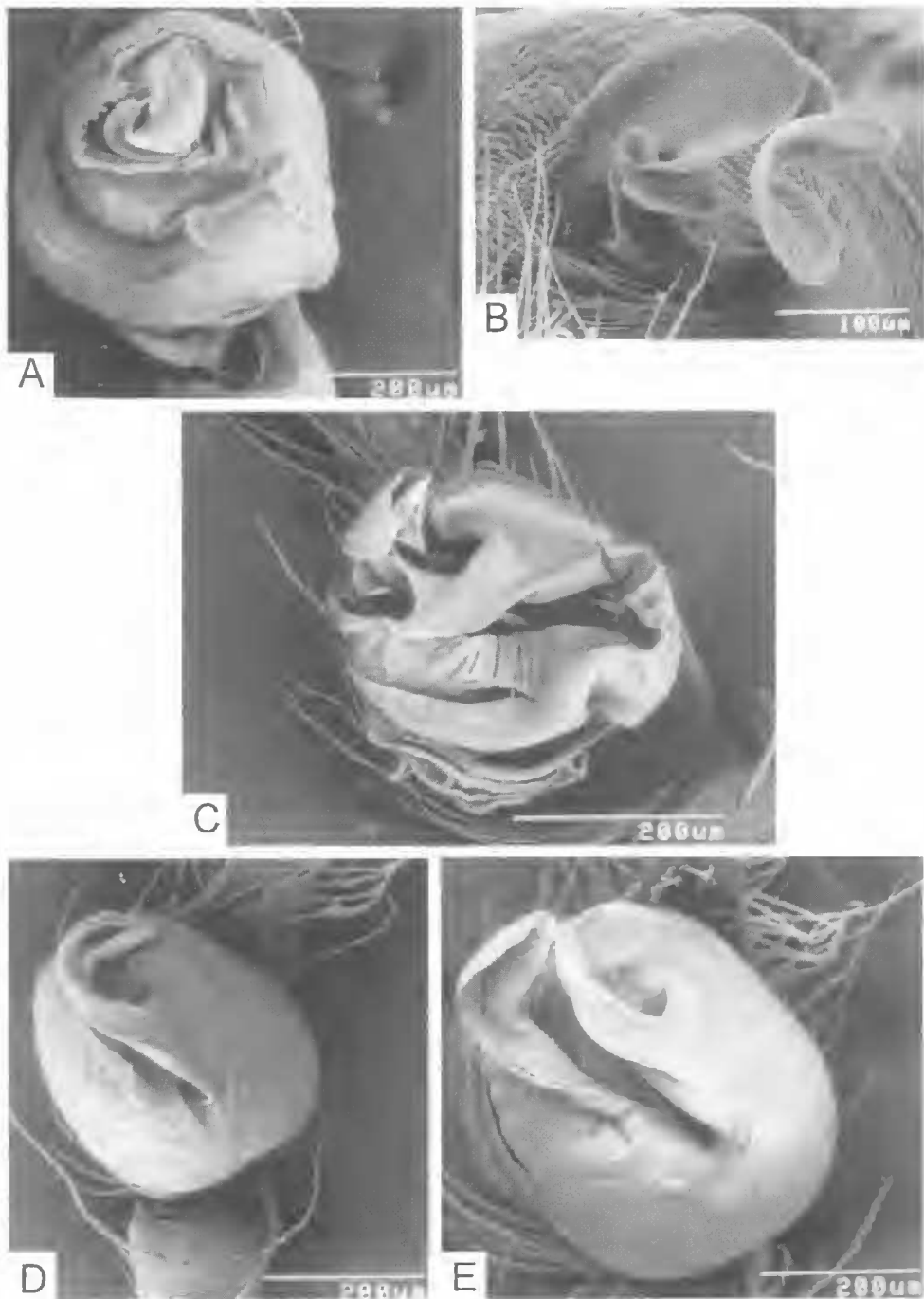


FIG. 9. A,B, *Wabua cleveland* sp. nov.; A, ♂ palp (ventral expanded); B, conductor/embolus and anterior tegular process (anterior). C, *Wabua paluma* sp. nov. ♂ palp (prolateral). D, E, *Wabua halifax* sp. nov., ♂ palp (ventral, prolatero-ventral).

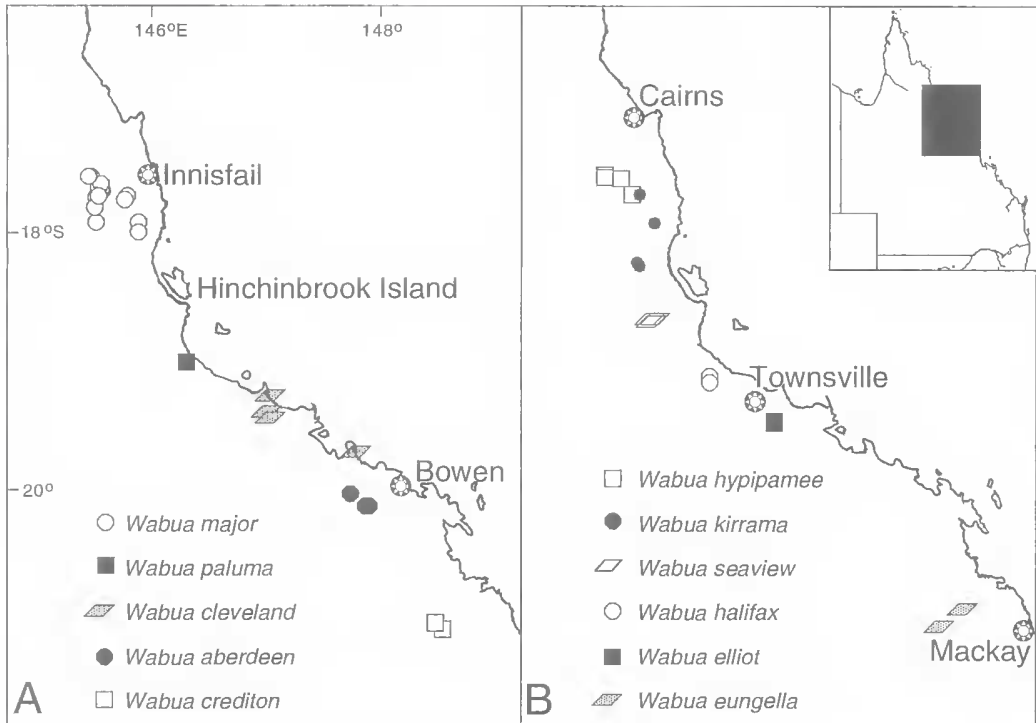


FIG. 10. Maps showing distribution of *Wabua* spp. in north Queensland.

summit, PF and intercepts, i.-20.iii.1991, A. Graham (S42160); ♂, Mt Halifax summit, open heath, 20.iii.1991, A. Graham (S42161); ♂, Mt Halifax, PF, xii.1990-8.i.1991, A. Graham (S42162); ♀, same data (S33733); 3♂, Bluewater Ra. 19°10', 146°23', 600m, sieved litter, 7.xii.1986, GBM, GT (S42158); ♀, (S42159); ♀, Bluewater Ra. 45km WNW Townsville, 6-700m, rainforest, 6-8.xii.1986, GBM, GT, SH (S42194).

DIAGNOSIS. Epigynal atrium small, situated well forward of the epigastral groove (cf. all species except *W. paluma*). Embolus without large retroventral keel (cf. *W. paluma*), slight keel distally.

DESCRIPTION. *Female.* CL 1.5, CW 1.1, AL 1.6, AW 1.1. Ratio of AME:ALE:PME:PLE is 5:9:9:9. Legs 4123, I 6.6; II 5.2; III 4.8; IV 6.7. Notation of spines similar to *W. major*. Calamistrum with 12 setae. Epigynum (Fig. 8K-N): small atrium well forward of epigastral groove. Females varied in length 2.6-3.3.

Male. CL 1.4, CW 1.1, AL 1.4, AW 0.8. Legs 4123, I 5.9; II 4.9; III 4.4; IV 6.3. Male palp (Figs 80, 9D,E): simple embolus with slight keel distally. Tibia slightly longer than wide 1:0.7.

RTA small; four very long discrete ventral setae. Males varied in length from 2.6-3.6.

DISTRIBUTION. (Fig. 10B) Occurs in rainforest and adjacent heath at 600-1050m at the southern end of the Paluma Range. It does not overlap with the range of the adjacent *W. paluma*.

DISTRIBUTION

Wabua comprises a group of mostly allopatric species from the mountain rainforests of the southern half of the Wet Tropics region and the inland portion of the mid-eastern Queensland rainforest region. The only species that extends to the lowlands is *W. cleveland*. The greatest diversity is seen at the northern end of its range where three species (*W. hypipamee*, *W. major* and *W. kirrama*) partly overlap in ranges to the south and west of the Atherton Tableland. The genus is notably absent from the northern half of the Wet Tropics including the Carbine Tableland and the Bellenden Ker Range which are diverse for other invertebrate taxa (Monteith, 1995; Baehr, 1995). Comparing the range of *Wabua* with that of other kababinine genera (Fig. 11) shows that on the

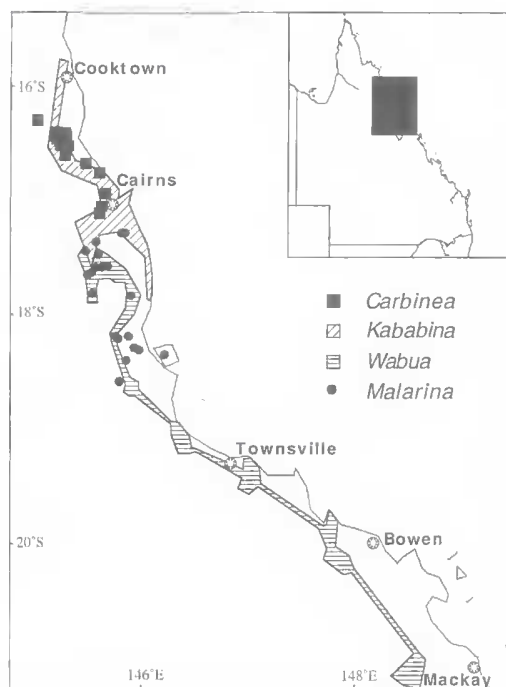


FIG.11. Map showing distribution of genera in the Kababininae in north Queensland.

Carbine Tableland *Wabua* may be replaced by *Kababina* or *Carbinea*, the only ecribellate genus. Nothing is known of the web of *Carbinea* but because it has no cribellum it may occupy a different microhabitat from *Kababina*. In the Bellenden Ker Range one species of both *Kababina* (*K. alta*) and *Malarina* (*M. masseyensis*) occur together at the northern limit of the latter. *Wabua* partly overlaps with *Malarina* on the Atherton Tableland mainly to the south and west while *Malarina* ranges eastward to the coast and Hinchinbrook Island.

RELATIONSHIPS OF *WABUA*

TERMINAL TAXA. A cladistic analysis examined 51 characters (Table 2) for relationships of the 11 *Wabua* spp. and 17 other taxa (Table 3). Outgroup comparison was with cosmopolitan *Oecobius navus* and an undescribed Australian dictynid.

Previous studies of the subfamily Kababininae have described the genera *Kababina* (Davies, 1995), *Carbinea* (Davies, 1999) and *Malarina* (Davies & Lambkin, 2000). Cladistic analysis including many taxa of the Amaurobioidea outlined the difficulty of family placement of the

Kababininae. Inclusion of *Wabua* gen. nov., with a further 11 taxa, into the analysis caused loss of basal resolution when specific differences were scored. Considerable difficulties also arise in attempting to recognise primary homology across such a large and diverse group. Therefore the number of taxa outside the Kababininae has been reduced from 20 to 11, while maintaining sufficient exemplars to indicate placement within the Amaurobioidea. Type species for genera have been scored wherever possible.

DATA ANALYSIS. We analysed the data matrix of 51 characters for the 28 taxa (Table 3) using PAUP version 3.1.1 (Swofford, 1993) on a Power Macintosh 7100/66. Heuristic searches of the data were completed using 10 random step-wise addition sequences, tree-bisection-reconnection (TBR) branch swapping, MULPARS and branches having maximum length zero collapsed to yield polytomies. Semistrict consensus (Bremer, 1990) of the most parsimonious trees was computed using PAUP. Analyses were repeated using Hennig86 version 1.5 (Farris, 1988). The command *nh** was used to find initial trees. The trees retained were then passed to the extended branch swapper, *bb**.

The data matrix (Table 3) was prepared using MacClade version 3.01 (Maddison & Maddison, 1992) and PAUP version 3.1.1. Figure 12 was prepared using CLADOS version 1.2 (Nixon, 1992) with DELTRAN optimisation. Bremer support (Källersjö et al., 1992) to indicate character support for nodes on the cladogram was calculated using the computer program Autodecay (Eriksson & Wikström, 1996).

RESULTS. Heuristic searches of 51 characters for the 28 taxa generated 4 most parsimonious trees of tree length 138, consistency index (Kluge & Farris, 1969) 0.62, consistency index excluding uninformative characters 0.58, retention index (Farris, 1989) 0.79 and rescaled consistency index (loc. cit.) 0.48. Figure 12 shows characters, character states and Bremer support values (above the nodes) on the preferred most parsimonious tree.

DISCUSSION

MISSING AND INAPPLICABLE DATA. Cladistic programs account for missing data by assigning states given the most parsimonious distribution of known characters. Missing data can a) contribute to the instability and poor resolution of cladograms (Novacek, 1992); and b) lead to the generation of different most

TABLE 2. Characters and character states.

1. AME: as large or larger than ALE (0); smaller (1) 2. CH: normal (0); small (1) 3. Retromarginal CH teeth: 2+ (0); 2 (1); 1 (2); 0 (3) 4. Promarginal CH teeth: 3+ (0); 3 (1); 2 (2); 0 (3) 5. Long prolateral seta at base of fang: absent (0); present (1) 6. Carapace: oval (0); round (1) 7. Foveal area highest: absent (0); present (1) 8. ♀ leg I: shorter than leg IV (0); equal to or longer than leg IV (1) 9. Stridulatory ridges on ♂ coxa I: absent (0); present (1) 10. Feathery hairs: absent (0); present (1) 11. MT preening comb: absent (0); present (1) 12. MT TRICH: 2+ (0); 1 (1) 13. T TRICH: 0 (0); 2+ (1); double row (2) 14. T rod: absent (0); present (1) 15. Anal tubercle: normal (0); enlarged (1) 16. PLS distal segment: normal (0); elongate (1) 17. CR spinning fields: 2 (0); 1 (1); absent (2) 18. * CAL: proximal (0); proximo-medial (1); long medial (2); no CAL (3) 19. MAP ♀ ALS: 2 (0); 1 and nubbin (1); 1 (2) 20. MAP ♀ ALS: mesal (0); anterior (1) 21. PCR ♀ PMS: one shaft per base (0); more than one shaft (1); absent (2); no CR (3) <i>Female characters</i> 22. * EPIG gonopores: lateral (0); central (1); posterior (2); anterior (3) 23. * Medial EPIG atrium: absent (0); present (1) 24. * Posterior rim of medial atrium/EG: no medial atrium (0); close (1); well forward (2) 25. * Width/length medial atrium: no medial atrium (0); < 2x wider than long (1); 2-3x wider than long (2); > 3x wider than long (3) 26. * Loop in ID anterior to EPIG atrium: no atrium (0); atrium but anterior loop absent (1); present (2) 27. ID: simple (0); loosely coiled (1); tightly coiled (2) 28. * Posterior EPIG scape: no scape (0); small knob (1); short (2); long (3) 29. EPIG lateral teeth: absent (0); present (1)	<i>Male characters</i> 30. * E: long spiniform (0); short spiniform (1); short broad (2); long broad (3) 31. * Tegular origin of E: postcroventral (0); medial (1); anteroventral (2) 32. Width of medial section of E: uniform or decreasing (0); increasing at prolateral curve (1) 33. PE APOPH: absent (0); unbranched (1); branched (2) 34. E APOPH prolateral keel: absent (0); present (1) 35. E APOPH retrolateral keel: absent (0); present (1) 36. E APOPH plate-like setae: absent (0); present (1) 37. PLD setae E APOPH: absent (0); present (1) 38. * E APOPH 2 subdistal folds: absent (0); pointed (1); blunt, reduced (2) 39. Separate retrolateral anterior tegular sclerite: absent (0); present (1) 40. Anterior prolateral tegular extension: absent (0); present (1) 41. * Conductor: irregular (0); short rounded (1); large T-shaped (2); s-shaped - falciform (3); long rounded (4) 42. Median APOPH: absent (0); present (1) 43. Orientation of CB to bulb: dorsal (0); lateral (1) 44. RTA/CB length: absent (0); quarter or less (1); more than half (2) 45. * RTA proximal projection: no RTA (0); no proximal projection (1); blunt swelling (2); pointed spur (3) 46. * RTA dorsal branch: no RTA (0); branch absent (1); branch present (2) 47. * RTA extra distal branch: no RTA (0); extra branch absent (1); extra branch present (2) 48. Palpal tibia with very long ventral setae: absent (0); present (1) 49. * Retroventral palpal tibial setae: absent (0); discrete (1); comb (2) 50. Palp tibia length/width: shorter or long as wide (0); longer than wide (1) 51. Palpal P APOPH: absent (0); present (1) [* Multistate characters treated as unordered]
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parsimonious trees than when the actual values for the states are included (Nixon & Davis, 1991).

Platnick et al. (1991) showed that cladistic computer analysis of data matrices containing missing entries (missing or inapplicable data) may produce fully resolved cladograms that cannot be supported by any conceivable assignment of the possible states because of nodes supported by mutually exclusive optimisations of the same character, or optimisations at internal node of unobserved conditions. Wilkinson (1995) considered that some of these trees contained linked sets of interior branches that simultaneously have zero and non-zero lengths, a problem that current computer algorithms have difficulty dealing with. Hennig86 and PAUP version 3.1.1 report resolutions supported by potential optimisations,

whether or not the optimisations supporting different branches are simultaneously possible. This can result in cladograms that are not supported by the matrix (Nixon & Wheeler, 1992).

While most systematists code inapplicables as missing data, Maddison (1993) suggested coding the inapplicable data as a new state in a multistate character. While this methodology is reliant on a questionable assessment of primary homology, it avoids the production of large numbers of unstable, unsupported or unresolved cladograms (Novacek, 1992); and more importantly non-sensical optimisations of unobserved conditions. For these reasons we coded inapplicables of *Oecobius* as separate plesiomorphic states in multistate characters, thus avoiding the problems

TABLE 3. Data matrix.

Taxa	Character Number				
	10	20	30	40	50
<i>Oecobius navus</i> Blackwall	0133010000	0100110120	2200000001	0000000000	0100000000 0
<i>Dictynidae</i> sp.	1020000100	0100001021	0100002000	0000000000	2011111000 0
<i>Badumna longinqua</i> (Koch)	0010000100	0010000000	1112210010	0000000000	3101111000 0
<i>Paramatachia decorata</i> Dalmas	0010000100	0010001200	0300000000	0000000000	3001111000 1
<i>Desis</i> sp.	1010000100	0020002321	3100002010	0000000000	3101111001 0
<i>Amphinecta milina</i> Forster & Wilton	1010000000	1010002310	3000001010	2000000000	1101111001 0
<i>Anaurobius fenestralis</i> (Stroem)	0000000100	1010000000	0000000012	2000000000	1101121000 0
<i>Storenosoma terraena</i> Davies	1012000010	1010002310	3200000012	2000000000	1101121000 0
<i>Otira</i> sp.	1012000010	1011002310	3200000002	2000000001	1101121000 0
<i>Stiphidion facetum</i> Simon	0011100101	0010000100	1200000000	0000000000	2001111000 0
<i>Stiphidion adornatum</i> Davies	0011100101	0010000100	1200002000	0000000000	2001111000 0
<i>Kababina alta</i> Davies	1012101101	0010000000	0112320000	1001000000	4002112110 0
<i>Kababina covacevichae</i> Davies	1012101101	0010000000	0112220000	1000000000	4002112110 0
<i>Carbinea longiscapa</i> Davies	1012101101	0010002300	3112210303	2020000000	4002111110 0
<i>Carbinea breviscapa</i> Davies	1012101101	0010002300	3112210203	2020000000	4001111110 0
<i>Malarina monteithi</i> Davies	1012101101	0010000000	0112210103	2010011000	4001111110 0
<i>Malarina cardwell</i> Davies	1012101101	0010000000	0112112103	2010011000	4001111110 0
<i>Wabua major</i> sp. nov.	1012101101	0010000000	0111121003	2000000000	4001211110 0
<i>Wabua aberdeen</i> sp. nov.	1012101101	0010000000	0111121003	2100000200	4001111120 0
<i>Wabua cleveland</i> sp. nov.	1012101101	0010000000	0111121003	2000000010	4001111111 0
<i>Wabua crediton</i> sp. nov.	1012101101	0010000000	0111121003	2100000100	4001111120 0
<i>Wabua elliot</i> sp. nov.	1012101101	0010000000	0111121003	2001000000	4001111110 0
<i>Wabua eungella</i> sp. nov.	1012101101	0010000000	0111121003	2000000100	4001111120 0
<i>Wabua halifax</i> sp. nov.	1012101001	0010000000	0112121003	2000000000	4001111110 0
<i>Wabua hypipamee</i> sp. nov.	1012101101	0010000000	0111121003	2000000000	4001311110 0
<i>Wabua kirrana</i> sp. nov.	1012101101	0010000000	0111121003	2000000100	4001111110 0
<i>Wabua paluma</i> sp. nov.	1012101001	0010000000	0112121003	2001100000	4001111110 0
<i>Wabua seaweave</i> sp. nov.	1012101101	0010000000	0111121003	2000100000	4001111110 0

resulting from computerised cladistic analyses of missing data.

RELATIONSHIPS IN THE AMAUROBIOIDEA. *Oecobius* and *Dictynidae* sp. appear as distinct from the ingroup which is regarded as the Amaurobioidea. The Amaurobioidea, Kababininae, *Kababina*, *Carbinea*, *Malarina* and *Wabua* form well-resolved monophyletic clades. *Stiphidion* remains as the sister group to the Kababininae, however support is provided by characters found convergently in many other taxa of the Amaurobioidea that could not be included here. Placement of the subfamily within the Stiphidiidae on this basis is not reasonable.

The Amaurobioidea continues to form two distinct clades (Davies, 1999; Davies & Lambkin, 2000). In this analysis however *Anaurobius* (Amaurobiidae), *Paramatachia* and *Badumna* have moved from a basal position in the clade including the Kababininae to a basal position in the clade containing *Desis* (Desidae) and *Amphinecta* (Amphinectidae). The inclusion in one clade of the type genera of three families indicates one of the problems confronting systematists working on this diverse group.

Wabua contains two monophyletic species-groups *W. halifax* and *W. paluma*; *W. kirrama*, *W. eungella*, *W. aberdeen* and *W. crediton*. *Wabua* is distinct from the other genera of the Kababinac. *Kababina* remains basal, as found in earlier studies (loc. cit.) *Carbinea* and *Malarina* form a clade, as sister-group to *Wabua*. The grouping of *Carbinea*, *Malarina* and *Wabua* is based on the incontrovertible synapomorphy of the long, broad embolus. *Carbinea* and *Malarina* are separated from *Wabua* by their possession of the proximal parembolic apophysis. Therefore *Wabua* contains species that have a long broad embolus, but without a proximal parembolic apophysis.

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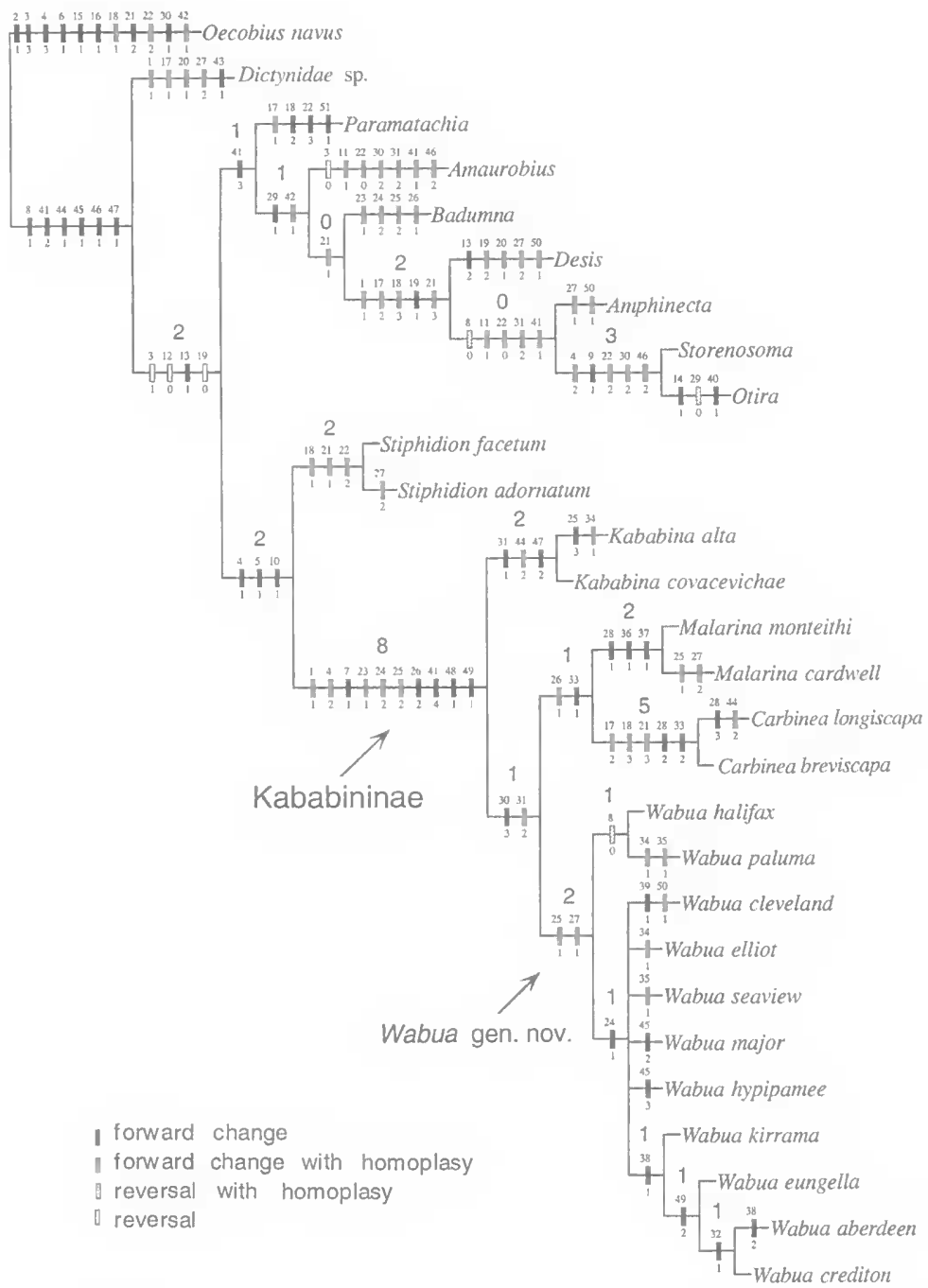


FIG. 12. Preferred most parsimonious tree showing the cladistic relationships of some Amaurobioidea. (Branch support shown above nodes).

which some of this material was collected and for the financial support of illustrator and co-author, Christine Lambkin, who also set up the cladistic analysis resulting in the cladogram. We are grateful for the support of other members of the Queensland Museum, particularly Katie Laws and Jennifer Cannon for their help in the preparation of this paper.

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